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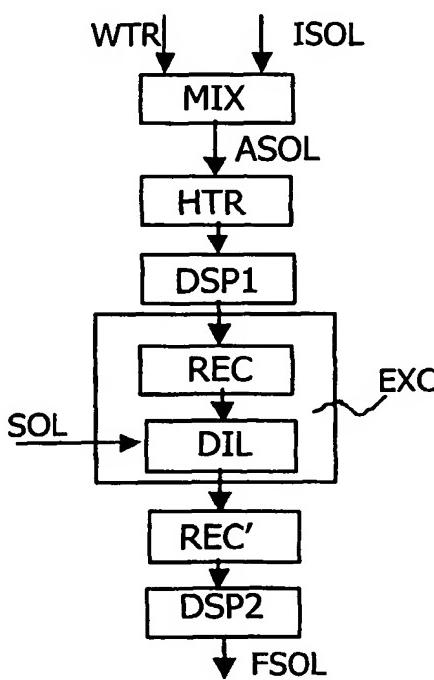
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(54) Title: PROCESS TO PRODUCE SOLUTIONS TO BE USED AS COATING IN PHOTO-CATALYTIC AND TRANSPARENT FILMS



(57) Abstract: The invention relates to a process for producing a stable solution containing Anatase titanium oxide intended to be deposited on a substrate in order to obtain a transparent photo-catalytic coating. Such a process includes the preparation of an initial stabilized peptized solution including a titanium precursor material, an organic solvent, an acid agent, the mixing of said initial solution with a large amount of water, the pH of the obtained intermediate solution being less than 3, subjecting said intermediate solution and its dispersion to a heat-treatment, the exchange of water by an organic solvent with low surface tension to obtain a final solution that is finally dispersed. The invention particularly allows to coat thermally sensitive and/or transparent substrates with photo-catalytic films of high optical quality.

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C01G23/053 B01J37/03 B01J21/06 B01J35/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 167 296 A (KAWASAKI HEAVY IND LTD) 2 January 2002 (2002-01-02) cited in the application paragraph '0082! - paragraph '0088! paragraph '0111! - paragraph '0113! claims 1-7 ----	14-16
Y	DATABASE WPI Section Ch, Week 200230 Derwent Publications Ltd., London, GB; Class D15, AN 2002-251861 XP002271677 & KR 2001 096 668 A (E & B KOREA), 8 November 2001 (2001-11-08) abstract ---- -/-	1-13
Y		1-13

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	US 6 576 589 B1 (CHOY JIN HO ET AL) 10 June 2003 (2003-06-10) claims 1-7; example 1 & KR 2001 028 286 A 6 April 2001 (2001-04-06) ---	1-16
A	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 11, 6 November 2002 (2002-11-06) & JP 2002 211928 A (ALTRA:KK), 31 July 2002 (2002-07-31) abstract ---	1-16
A	KARN R K ET AL: "On the synthesis of nanostructured TiO ₂ anatase phase and the development of the photoelectrochemical solar cell" INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, ELSEVIER SCIENCE PUBLISHERS B.V., BARKING, GB, vol. 24, no. 1, January 1999 (1999-01), pages 27-35, XP004158829 ISSN: 0360-3199 the whole document ---	1-16
P,A	EP 1 316 532 A (KONINKL PHILIPS ELECTRONICS NV) 4 June 2003 (2003-06-04) page 3, column 3, line 47 - line 55 ----	1-16
A	EP 1 146 099 A (JSR CORP) 17 October 2001 (2001-10-17) table 1 -----	1-16

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/EP 03/04141

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
EP 1167296	A	02-01-2002	JP JP JP JP EP WO	3122082 B2 2000225339 A 3055684 B2 2000233928 A 1167296 A1 0046153 A1		09-01-2001 15-08-2000 26-06-2000 29-08-2000 02-01-2002 10-08-2000
KR 2001096668	A	08-11-2001		NONE		
US 6576589	B1	10-06-2003	KR JP	2001028286 A 2001104797 A		06-04-2001 17-04-2001
JP 2002211928	A	31-07-2002		NONE		
EP 1316532	A	04-06-2003	FR EP	2832999 A1 1316532 A1		06-06-2003 04-06-2003
EP 1146099	A	17-10-2001	EP JP US JP	1146099 A2 2001354902 A 2002007006 A1 2002003785 A		17-10-2001 25-12-2001 17-01-2002 09-01-2002